

CLAIMS

What is claimed is:

1 1. A low pressure tire, comprising:

2 a torus of flexible, substantially inelastic material, wherein the material will
3 not deform at temperature of about 225°F, the torus includes an inner diameter
4 surface for engaging a tire supporting rim and an outer diameter surface for
5 contacting a support surface, wherein the torus can flatten under a load to facilitate
6 movement of the tire over soft or irregular support surfaces; and

7 a sealable opening for inflating and deflating the torus, wherein said
8 sealable opening comprises a valve stem housing and a valve stem having a
9 plurality of barbs which taper outwardly from the valve stem.

1 2. The tire of claim 1 wherein the inside diameter of the tires' valve stem
2 housing is less than the largest outside diameter of the valve stem barbs.

1 3. The tire of claim 2 wherein the inside diameter up to the tires' valve stem
2 housing is less than at least about 50 % of the largest outside diameter of the valve
3 stem.

1 4. The tire of claim 1 wherein the valve stem is a plastic or metal.

1 5. The tire of claim 1 wherein the valve stem comprises at least 3 barbs.

1 6. The tire according to claim 1, wherein the material is polyurethane.

1 7. The tire according to claim 1, wherein the material is a material having

elasticity, flexibility, chemical and/or temperature tolerance characteristics similar to polyurethane.

8. The tire according to claim 1, wherein inflation of the tire may be increased to facilitate movement of the tire over a hard support surface and inflation of the tire may be decreased to facilitate movement of the tire over a soft support surface.

9. The tire according to claim 1, further comprising:
a radially inwardly extending flange.

10. The tire according to claim 1, wherein the outer diameter surface that contacts the support surface is at least substantially free from reinforcing fabrics or cords.

11. The tire according to claim 1, wherein the tire is inflated to a pressure of about 1 psi to about 10 psi.

12. The tire according to claim 1, wherein the flexible inelastic material flexes or flattens under a load but does not stretch, whereby upon further inflation the tire will not expand substantially outward.

13. The tire according to claim 1, wherein the flexible inelastic material flexes to deform but does not stretch upon encountering an obstacle when under a load.

14. The tire according to claim 1, wherein the tire is blow molded.

1 15. A tire and wheel combination, comprising:
2 a low pressure tire comprising a torus of flexible, substantially inelastic
3 material, wherein the material will not deform at temperature of about 225°F, the
4 torus includes an inner diameter surface for engaging a tire supporting rim and an
5 outer diameter surface for contacting a support surface, wherein the torus can
6 flatten under a load to facilitate movement of the tire over soft or irregular support
7 surfaces, and a sealable opening for inflating and deflating the torus, wherein said
8 sealable opening comprises a valve stem housing and a valve stem housing a
9 plurality of barbs wherein taper inwardly in the direction of the valve stem
10 housing; and
11 a tire supporting rim comprising a cylindrical center section for engaging
12 the inner diameter surface of the tire, a pair of support flanges axially extending
13 from opposite sides of the center section for engaging the tire as it flattens under a
14 load.

1 16. The tire and wheel combination of claim 15 wherein the inside diameter
2 of the valve stem housing is less than the largest outside diameter of the valve
3 stem.

1 17. The tire and wheel combination of claim 15 wherein the inside diameter
2 of the tires' valve stem housing is less than at least about 50 % of the largest
3 outside diameter of the valve stem.

1 18. The tire and wheel combination of claim 15 wherein the valve stem is a
2 plastic or metal.

1 19. The tire and wheel combination of claim 15 wherein the valve stem
2 comprises at least 3 barbs.

1 20. The tire and wheel combination according to claim 15, wherein the
2 material that the tire is made of is polyurethane.

1 21. The tire and wheel combination according to claim 15, wherein the
2 material that the tire is made of is a material having elasticity, flexibility, chemical
3 and/or temperature tolerance characteristics similar to polyurethane.

1 22. The tire and wheel combination according to claim 15, wherein
2 inflation of the tire may be increased to facilitate movement of the tire over a hard
3 support surface and inflation of the tire may be decreased to facilitate movement
4 of the tire over a soft support surface.

1 23. The tire and wheel combination according to claim 15, wherein the
2 center section of the wheel receives an axle extending therethrough and the wheel
3 rotates about the axle.

1 24. The tire and wheel combination according to claim 15, wherein the
2 center section of the wheel engages an axle extending therethrough and the wheel
3 and the axle rotate together.

1 25. The tire and wheel combination according to claim 15, wherein the
2 wheel further comprises an axle axially extending from opposite sides.

1 26. The tire and wheel combination according to claim 15, wherein the
2 cylindrical flange portion of the wheel has a greater diameter than the diameter of
3 the inner surface.

1 27. The tire and wheel combination according to claim 15, wherein the
2 cylindrical flange portion of the wheel has a diameter less than three times the
3 diameter of the inner surface.

1 28. The tire and wheel combination according to claim 15, wherein the tire
2 further comprises a radially inwardly extending flange.

1 29. The tire and wheel combination according to claim 28, wherein the rim
2 further comprises two separable axially extending halves between which the
3 radially inwardly extending flange is clamped upon assembly of the two halves,
4 and means for securing the halves to each other.

1 30. The tire and wheel combination according to claim 15, wherein the
2 outer diameter surface that contacts the support surface is at least substantially free
3 from reinforcing fabrics or cords.

1 31. The tire and wheel combination according to claim 15, wherein the tire
2 is inflated to a pressure of about 1 psi to about 10 psi.

1 32. The tire and wheel combination according to claim 15, wherein the
2 flexible inelastic material flexes or flattens under a load but does not stretch,
3 whereby upon further inflation the tire will not expand substantially outward.

1 33. The tire and wheel combination according to claim 15, wherein the
2 flexible inelastic material flexes to deform but does not stretch upon encountering
3 an obstacle when under a load.

1 34. The tire and wheel combination according to claim 15, wherein the

torus has a circular area of revolution and an axial length of the tire supporting rim is at least twice an undeformed radius of the circular area of revolution of the torus but no greater than π times the radius.

35. The tire and wheel combination according to claim 15, wherein each flange comprises a radially outwardly flaring conical portion extending from the central section and an axially extending cylindrical flange portion extending from the conical portion.

36. The tire and wheel combination according to claim 35, wherein the rim further comprises two separable axially extending halves.

37. The tire and wheel combination according to claim 15, wherein the rim further comprises two separable axially extending halves.

38. The tire and wheel combination according to claim 15, wherein the tire distributes the load sufficiently to permit loads in excess of about 250 pounds per tire to travel across a surface without damaging the surface.

39. The tire and wheel combination according to claim 15, wherein the tire is blow molded.

40. A wheeled vehicle, comprising:
a frame;
at least one low pressure tire comprising a torus of flexible, substantially inelastic material, wherein the material will not deform at temperature of about 225°F, the torus includes an inner diameter surface for engaging a tire supporting rim and an outer diameter surface for contacting a support surface, wherein the

7 torus can flatten under a load to facilitate movement of the tire over soft or
8 irregular support surfaces, and a sealable opening for inflating and deflating the
9 torus, wherein said sealable opening comprises a valve stem housing and a valve
10 stem having a plurality of barbs which taper inwardly in the direction of the valve
11 stem housing;

12 at least one tire supporting rim comprising a cylindrical center section for
13 engaging the inner diameter surface of the tire, a pair of support flanges axially
14 extending from opposite sides of the center section for engaging the tire as it
15 flattens under a load; and

16 at least one axle interconnecting the rim and the frame such that the at least
17 one rim and the at least one tire may rotate.

1 41. The wheeled vehicle of claim 40 wherein the inside diameter of the
2 valve stem housing is less than the largest outside diameter of the valve stem.

1 42. The wheeled vehicle of claim 40 wherein the inside diameter of the
2 valve stem housing is less than at least about 50 % of the largest outside diameter
3 of the valve stem.

1 43. The wheeled vehicle of claim 40 wherein the valve stem comprises at
2 least 3 barbs.

1 44. The wheeled vehicle according to claim 40, wherein the vehicle is
2 selected from the group consisting of a wagon, a wheel barrow, a tricycle, a
3 stroller, a golf bag, pull cart, a small boat dolly, a beach cart, a beach wheelchair, a
4 one-wheeled cart, a two-wheeled cart, a three-wheeled cart, a four-wheeled cart, a
5 cart with more than four wheels, a hand truck, a backpack carrier, a luggage
6 carrier, and a vendor cart.

1 45. The wheeled vehicle according to claim 40, wherein the tire is blow
2 molded.

1 46. A method for moving a land vehicle, the method comprising:
2 at least one providing the vehicle with at least one low pressure tire
3 comprising a torus of flexible, substantially inelastic material, wherein the material
4 will not deform at temperature of about 225°F, the torus includes an inner
5 diameter surface for engaging a tire supporting rim and an outer diameter surface
6 for contacting a support surface, wherein the torus can flatten under a load to
7 facilitate movement of the tire over soft or irregular support surfaces, and a
8 sealable opening for inflating and deflating the torus wherein said sealable
9 opening comprises a valve stem housing and a valve stem having a plurality of
10 barbs which taper inwardly in the direction of the valve stem housing;

11 providing a tire supporting rim comprising a cylindrical center section for
12 engaging the inner diameter surface of the tire, a pair of support flanges axially
13 extending from opposite sides of the center section for engaging the tire as it
14 flattens under a load; and

15 moving the vehicle across the support surface while the vehicle is
16 supported on the tire.

1 47. The method according to claim 46, wherein the support surface includes
2 at least one member selected from the group consisting of light foam core
3 aluminum, sand, mud, asphalt, concrete, soil, grass, ice, snow, rock, gravel, leaves,
4 tree trunks, tree branches, and wood.

1 48. The method according to claim 46, wherein the tire is blow molded.

1 49. A method for making a tire, the method comprising:

2 blow molding a torus of flexible, substantially inelastic material, wherein
3 the material will not deform at temperature of about 225°F, the torus includes an
4 inner diameter surface for engaging a tire supporting rim and an outer diameter
5 surface for contacting a support surface, wherein the torus can flatten under a load
6 to facilitate movement of the tire over soft or irregular support surfaces; and

7 providing a sealable opening in the torus for inflating and deflating the
8 torus, wherein further comprises providing a pin in the mold during the blow
9 molding;

10 opening the mold and removing said pin and creating the inside diameter of
11 a valve stem socket;

12 inserting a valve stem into said socket wherein said valve stem comprises a
13 plurality of barbs.